

DRYOPOIDEA OF THE RYUKYU ARCHIPELAGO, I*

(COLEOPTERA)

by

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The Ryukyu Archipelago is one of the most interesting regions in Asia from a zoogeographical viewpoint. Up to the present, the bulky works concerning the fauna of the archipelago have been reported by many zoologists. According to some of their works, the fauna differs more or less on each island and a boundaryline between the Palearctic and the Oriental Regions is recognized between Is. Yaku shima and Is. Amami-Ôshima.

The Ryukyu Archipelago includes all the islands lying between Kyushu and Taiwan.

The superfamily Dryopoidea of the Ryukyu Archipelago were studied by T. Nakane (1950—1964), S. Nomura (1957—1963) and M. Satô (1960—1964), and more than twenty species are recorded from there. In this paper I want to make a list of all the Dryopoidea-species found on the Ryukyu Archipelago, basing on the records from there and on the specimens examined by me. The specimens used in the study were collected mainly at the various localities of the archipelago from 1961 to 1964 by Messrs. Y. Arita and N. Ohbayashi of Ehime University, Mr. T. Shibata in Osaka and by me. Additionally, through the courtesy of Prof. K. Yasumatsu and Mr. T. Hidaka, I was able to study some specimens of the families Elminthidae and Heteroceridae collected on Is. Okinawa-hontô which are preserved in the collection of the Entomological Laboratory, Kyushu University. The type-series of the new species described in the paper are deposited in the collection of the Entomological Laboratory, Ehime University or preserved in my collection.

I am greatly obliged to Prof. T. Ishihara and Prof. T. Tachikawa of Ehime University, Mr. K. Ohbayashi in Nagoya and Prof. M. Hiro of Nagoya Women's University for their kind guidance and encouragement and to Dr. A. Takahashi of Nagoya University for having read the manuscript. Deep thanks are also due to the many entomologists mentioned previously and the following gentlemen for the privilege of studying the useful specimens and the valuable literature: Mrs. F. Fujii of Nagoya Women's University, Messrs. S. Hisamatsu, M. Miyatake and S. Tamai of Ehime University, Mr. S. Ishida in Yokkaichi, Mr. S. Nomura of Tôhô-Gakuen, Tokyo and Mr. Y. Miyatake of Kyushu

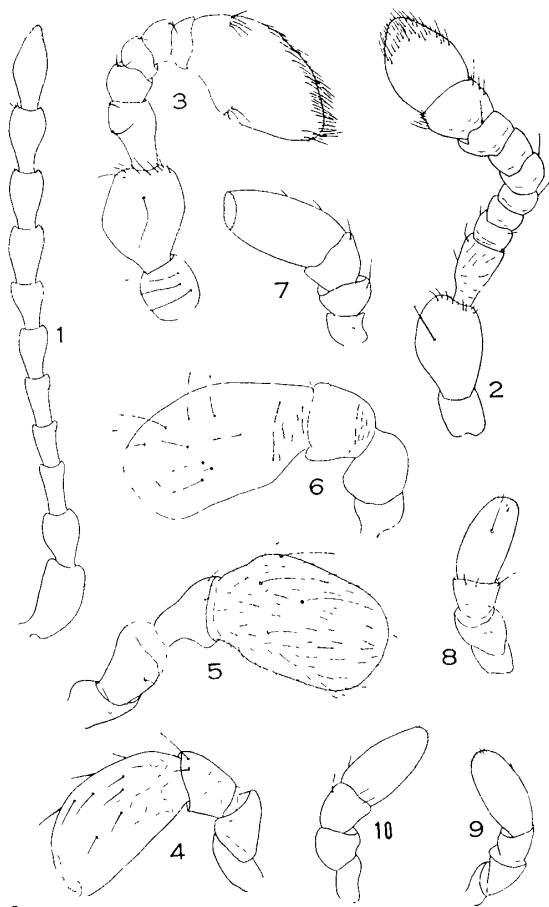
* Studies on the Aquatic Coleoptera from the Ryukyu Archipelago, No. 8.

University.

Family Elminthidae

Key to the tribes and the genera of the family Elminthidae in the Ryukyus

- 1 (8) Antennae long, slender, sometimes short and 11-jointed; terminal joint of maxillary palpi stout; median lobe of male genitalia moderately sclerotized, somewhat narrow and always shorter than twice the length of basal piece.Elminthini Schuckard & Spry
- 2 (7) Protibia without tomentose fringe on the inner side; first abdominal segment lacking any carina; terminal joint of antennae slender; apophysis of penis not visible.
- 3 (4) Second stria of each elytron long and extending full length of the elytron; terminal joint of maxillary palpi provided with some setae and its apices somewhat densely pubescent; basal piece of male genitalia pubescent at base..... *Stenelmis* Dufour
- 4 (3) Second stria of each elytron short and contiguous with the first at basal fifth; basal piece of male genitalia not pubescent.
- 5 (6) Pronotum with sublateral keels; terminal joint of maxillary palpi closely pubescent all over and provided with few setae *Ordobrevia* Sanderson
- 6 (5) Pronotum without sublateral keel; terminal joint of maxillary palpi provided with some setae and its apices closely pubescent *Nomuraelmis* M. Satô
- 7 (2) Protibia with tomentose fringe on the inner side; first abdo-



Figs. 1—3. Antenna of: 1. *Nomuraelmis amamiensis* M. Satô, 2. *Grouvellinus subopacus* Nomura, 3. *Urumaelmis uenoi tokarana* M. Satô.

Figs. 4—10. Maxillary palpus of: 4. *Stenelmis hisamatsui* M. Satô, 5. *Ordobrevia amamiensis okinawana* Nomura, 6. *Nomuraelmis amamiensis* M. Satô, 7. *Grouvellinus subopacus* Nomura, 8. *Zaitzevia yaeyamana* M. Satô, 9. *Zaitzevia elongata* Nomura, 10. *Urumaelmis uenoi tokarana* M. Satô.

- minal segment bearing two carinae; terminal joint of antennae stout; apophysis of penis visible *Grouvellinus* Champion
- 8 (1) Antennae short, stout and 8-jointed; terminal joint of maxillary palpi slender; median lobe of male genitalia distinctly sclerotized, broad and longer than twice the length of basal piece.....
..... *Macronychini* Steffan
- 9 (10) Two carinae of the first abdominal segment distinct, beginning at the base and reaching near the posterior margin; each paramera of male genitalia presents a projection at apex.....*Zaitzevia* Champion
- 10 (9) Two carinae of the first abdominal segment feeble and not reaching the posterior margin; each paramera of male genitalia without any projection at apex..... *Urumaelmis* M. Satô

Tribe Elminthini (Stephens, 1828) Schuckard & Spry, 1840

Genus *Stenelmis* Dufour

Stenelmis Dufour, 1855. Ann. Soc. Nat. Zool., (2) 3: 158.

Type species: *Elmis canaliculata* Gyllenhal, 1808.

Key to the species of the genus *Stenelmis* in the Ryukyus

- 1 (4) Apex of prosternal process rounded; the sides of pronotum bisinuate.
- 2 (3) Sublateral keels of pronotum extending from the base to basal third; intervals of striae flat; granules of dorsal surface indistinct; length 2.15-2.30 mm.....*S. hisamatsui* M. Satô
- 3 (2) Sublateral keels of pronotum extending almost full length of the pronotum; intervals of striae convex; granules of dorsal surface distinct; length 2.45-2.60 mm..... *S. ishiharai* M. Satô
- 4 (1) Apex of prosternal process emarginate; the sides of pronotum not sinuate; length 2.50-2.70 mm..... *S. aritai* M. Satô

Stenelmis hisamatsui M. Satô

Stenelmis hisamatsui M. Satô, 1960. Kontyû, 28 (4) : 253, figs. 1, 2 (Is. Amami-Ôshima : Shin-mura). - Nomura, 1961. Akitu (Trans. Kyoto Ent. Soc.), 10 (1/2) : 3 (Is. Tokuno-shima : Kamishiro-no-kuragô, Fuki-gô, Amefurayô ; Is. Okino-erabu-shima). - Nomura, 1963. in Icon. Ins. Jap. Color. natur. ed., vol. 2 (Col.) : 145 (Is. Amami-Ôshima, Is. Toku-no-shima, Is. Okino-erabu-shima) . - M. Satô, 1965. New Entom., 13 (8) : 72 (Is. Toku-no-shima: Tokuwass-dô) .

Male genitalia: basal piece about 1.3 times as long as the length of median lobe, closely pubescent at base ; parameres distinctly shorter than median lobe, reflexed internally, distinctly expanded inwards at middle in ventral aspect, somewhat dully lobated at apical fifth in dorsal aspect and the lobe pubescent; median lobe stout, subparallel-sided, sparsely pubescent at

the basal and apical portions.

Specimens examined: 12 exs., Shin-mura, Is. Amami-Ôshima, June 23, 24, 1961, T. Shibata leg.; 14 exs., the Kamiko-gawa River, Is. Amami-Ôshima, June 11, 1962, M. Satô leg.; 5 exs., Shin-mura, Is. Amami-Ôshima, June 13, 16, 1962, M. Satô leg.; 5 exs., Kametsu, Is. Toku-no-shima, July 16, 1961, T. Shibata leg.; 2 exs., Tokuwasedô Cave, Is. Toku-no-shima, July 24, 1963, M. Satô and N. Ohbayashi leg.; 9 exs., Nishi-agina, Is. Toku-no-shima, July 25, 26, 1963, M. Satô and N. Ohbayashi leg.; 15 exs., Nago, Is. Okinawa-hontô, Aug. 16, 1958, T. Hidaka leg.; 6 exs., Yona, Is. Okinawa-hontô, May 25, 1963, Y. Arita leg.

Distribution: Is. Amami-Ôshima, Is. Toku-no-shima, Is. Okino-erabu-shima of the Amami Islands; Is. Okinawa-hontô of the Okinawa Islands.

Stenelmis ishiharai M. Satô

Stenelmis ishiharai M. Satô, 1965. Bull. Jap. ent. Acad., 1 (7) : 31.

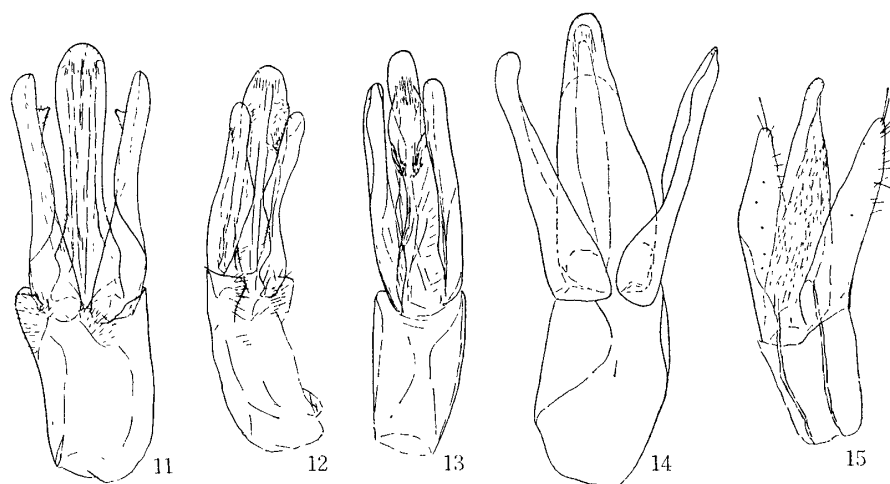
Male genitalia: basal piece about 1.5 times as long as the length of median lobe, provided with close pubescence at base just both sides of the middle; parameres a little shorter than median lobe, narrowed anteriorly, reflexed inwardly at apical two-thirds, each paramera bears a lobe which is pubescent at apical fifth in dorsal side; median lobe slightly expanded anteriorly, narrowest near the middle, basal third sparsely pubescent.

Distribution: Is. Ishigaki-jima and Is. Iriomote-jima of the Sakishima Islands.

Stenelmis aritai M. Satô

Stenelmis aritai M. Satô, 1965. Bull. Jap. ent. Acad., 1 (7) : 32.

Distribution: Is. Yonaguni-jima of the Sakishima Islands.



Figs. 11-15. Male genitalia of: 11. *Stenelmis ishiharai* M. Satô (Is. Ishigaki-jima), 12. *Stenelmis hisamatsui* M. Satô (Is. Okinawa-hontô), 13. *Ordobrevia amamiensis* Nomura (Is. Amami-Ôshima), 14. *Nomuraelmis amamiensis* M. Satô (Is. Amami-Ôshima), 15. *Grouvellinus subopacus* Nomura (Is. Toku-no-shima).

Genus *Ordobrevia* Sanderson

Ordobrevia Sanderson, 1953. J. Kansas ent. Soc., 26 (4) : 159.

Type-species: *Stenelmis nibifera* Fall, 1901.

Key to the species and the subspecies of the genus *Ordobrevia*
in the Ryukyus

- 1 (6) Elytra black or brownish black, with pale spots.
- 2 (5) Humeral spots on elytra yellow, small and situated humeral region; the sides of pronotum strongly sinuate inwards at the apical third.
- 3 (4) Elytra black; elytral punctures in row somewhat large; length 2.40-2.65 mm.....*O. amamiensis amamiensis* Nomura
- 4 (3) Elytra brownish black; elytral punctures in row more or less small; length 2.45-2.75 mm.....*O. amamiensis okinawana* Nomura
- 5 (2) Humeral spots on elytra reddish brown, large and extend towards the suture; the sides of pronotum evenly rounded; length 1.90-2.20 mm.....
.....*O. maculata* Nomura
- 6 (1) Elytra black, without pale spots; length 1.90-2.05 mm
.....*O. gotoi* Nomura

Ordobrevia amamiensis (Nomura)

Stenelmis amamiensis Nomura, 1957. Akitu, 6 (1) : 4 (Is. Amami-Ôshima: Nishi-nakama) .

Ordobrevia amamiensis: Nomura, 1958. Tôhôt-Gakuhô, 8: 47 (Is. Amami-Ôshima). - Nomura, 1960. Akitu, 9 (2) : 35 (Is. Amami-Ôshima). - M. Satô, 1960. Kontyû, 28 (4) : 252 (Is. Amami-Ôshima: Shin-mura). - Nomura, 1963. in Icon. Ins. Jap. Color. natur. ed., vol. 2 (Col.) : 145, pl. 73, fig. 2 (Is. Amami-Ôshima) .

Male genitalia: basal piece about 1.5 times as long as the length of median lobe; parameres slightly narrowed anteriorly, definitely shorter than median lobe, rounded at apex; median lobe distinctly reflexed inwards from the base to apical fifth, provided with some teeth at just before the middle.

This species occurs very commonly on Is. Amami-Ôshima and frequently comes flying to a light at night.

Specimens examined: 31 e s., Shin-mura, Is. Amami-Ôshima, June 23, 24, and July 7, 1961, T. Shibata leg.; about 200 exs., Shin-mura, Is. Amami-Ôshima, June 12, 13, 1962, M. Satô leg.; 9 exs., Hatsuno, Is. Amami-Ôshima, July 28, 1963, M. Satô and N. Ohbayashi leg.

Distribution: Is. Amami-Ôshima of the Amami Islands.

Ordobrevia amamiensis okinawana Nomura

Ordobrevia amamiensis okinawana Nomura, 1959. Tôhôt-Gakuhô, 9: 34, pl. 1, fig. 3 (Is. Okinawa-hontô: Nago). - Nomura, 1960. Akitu, 9 (2) : 35 (Is.

Okinawa-hontô) . - Nomura, 1963. in Icon. Ins. Jap. Color. natur. ed., vol. 2 (Col.) : 145 (Is. Okinawa-hontô) .

This subspecies is closely similar to the nominate one and can not be distinguished easily from the latter.

Specimens examined: 9 exs., Nago, Is. Okinawa-hontô, Aug. 16, 1958, T. Hidaka leg.

Distribution: Is. Okinawa-hontô of the Okinawa Islands.

Ordobrevia maculata (Nomura)

Stenelmis maculata Nomura, 1957. Ent. Rev. Japan, 8 (2) : 43, fig. 3 (Honshu: Kurotake pass; Is. Yaku-shima: Tachû) .

Ordobrevia maculata: Nomura, 1958. Tôhō-Gakuhō, 8: 47 (Honshu, Is. Yaku-shima) . - Nomura and Baba, 1961. Ent. Rev. Japan, 13 (1) : 30 (Honshu: Niigata). - Nomura, 1963. in Icon. Ins. Jap. Color. natur. ed., vol. 2 (Col.) : 145, pl. 73, fig. 3 (Honshu, Kyushu, Is. Yaku-shima) .

No specimens from the Ryukyus were examined.

Distribution: Honshu, Kyushu and Shikoku*, the mainland of Japan; Is. Yaku-shima of the Ôsumi Islands.

Ordobrevia gotoi Nomura

Ordobrevia gotoi Nomura, 1959. Tôhō-Gakuhō, 9: 33, pl. 1, figs. 1, 2 (Honshu: Inunaki, Kimi-tôge). - Nomura, 1960. Akitu, 9 (2) : 35 (Honshu). - Nomura and Baba, 1961. Ent. Rev. Japan, 13 (1) : 30 (Honshu: Niigata). - Nomura, 1963. in Icon. Ins. Jap. Color. natur. ed., vol. 2 (Col.) : 145, pl. 73, fig. 4 (Honshu, Is. Tane-ga-shima).

Any specimen from the Ryukyus was unexamined.

Distribution: Honshu and Shikoku,** the mainland of Japan; Is. Tane-ga-shima of the Ôsumi Islands.

Genus *Nomuraelmis* M. Satô

Nomuraelmis M. Satô, 1964. Bull. Jap. ent. Acad., 1 (2) : 11.

Type-species: *Nomuraelmis amamiensis* M. Satô, 1964.

The genus was established by me and is closely allied to the genus *Stegoelmis* Hinton rather than the genus *Ordobrevia* Sanderson, to which the genus was compared in the original description. The genus can be separated easily from the genus *Stegoelmis* by the following points: second stria of each elytron short and contiguous with the first at the basal fifth, dorsal surface

* New record to the fauna of Shikoku (2 exs., Sugitate, Ehime Pref., June 25, 1959, M. Satô leg.; 1 ex., Iwaya-san, Ehime Pref., May 10, 1959, M. Satô leg.).

** New record to the fauna of Shikoku (10 exs., the Kamo-gawa River, Ehime Pref., Sept. 5, 1959, K. Kuwada leg.).

closely granulate, hind tibia slightly tuberculate in the inner side near the middle and basal piece of male genitalia large.

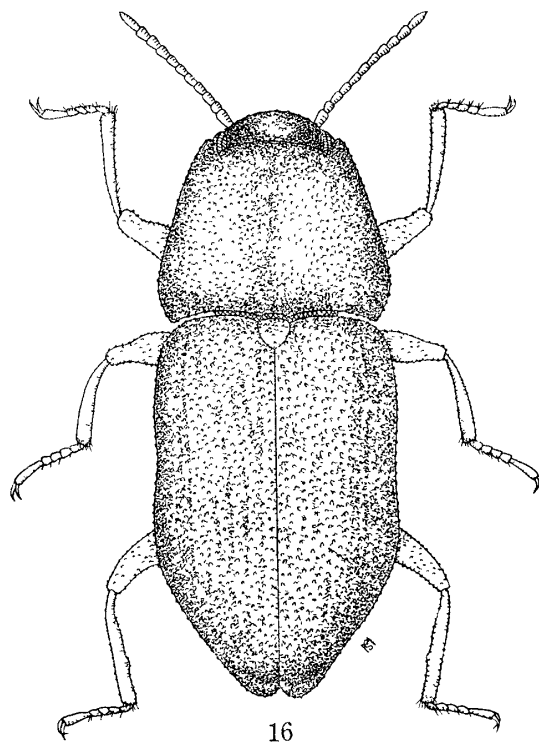


Fig. 16. *Nomuraelmis amamiensis* M. Satô.

Nomuraelmis amamiensis M. Satô

Nomuraelmis amamiensis M. Satô, 1964. Bull. Jap. ent. Acad., 1 (2) : 12, pl. 3 (Is. Amami Ôshima: Akaogi).

Male genitalia: basal piece about 1.3 times as long as the length of median lobe which is distinctly narrowed apically; parameres somewhat shorter than median lobe, distinctly reflexed inwards and evidently narrowed anteriorly.

In the original description, the species was erroneously described. The maxillary palpi was not 3 jointed but 4-jointed and the type-specimen was not female but male.

Distribution: Is. Amami Ôshima of the Amami Islands.

Genus *Grouvellinus* Champion

Grouvellinus Champion, 1923. Ent. Month. Mag., (3) 9: 168.

Microdes Motschulsky, 1857. Etud. Entom., 8: 48.

Growelleus Zaitzev, 1908. Horae Soc. Ent. Ross., 38: 311.

Type species: *Macronychus caucasicus* Motschulsky, 1839.

Key to the species of the genus *Grouvellinus* in the Ryukyus

- 1 (2) Body elongate, subparallel sided; second interval of each elytron somewhat convex at basal portion; legs black; length 2.03-2.21 mm...
.....*G. marginatus* (Kôno)

2 (1) Body elongate-oval; second interval of each elytron not convex at basal portion; legs reddish brown; length 1.55-1.75 mm.....
.....*G. subopacus* Nomura

Grouvellinus marginatus (Kôno)

Grouvelleus marginatus Kôno, 1934. Ins. Matsu., 8 (3) : 127 (Shikoku: Awa).
Grouvellinus marginatus: Nomura, 1957. Ent. Rev. Japan, 8 (2) : 44 (Is. Yaku-shima: Tachû). - Nomura, 1960. Akitu, 9 (2) : 36 (Hohshu, Shikoku, Kyushu). - Nomura and Baba, 1961. Ent. Rev. Japan, 13 (1) : 31 (Honshu: Niigata). - Nomura, 1963. Tôhô-Gakuhô, 13 : 52 (Honshu, Shikoku, Kyushu). - Nomura, 1963. in Icon. Ins. Jap. Color. natur. ed., vol. 2 (Col.): 146, pl. 73, fig. 18 (Honshu, Shikoku, Kyushu, Is. Yaku-shima).

No Ryukyu example of the present species was available for this study.

Distribution: Honshu, Shikoku and Kyushu, the mainland of Japan; Is. Yaku-shima of the Ôsumi Islands.

Grouvellinus subopacus Nomura

Grouvellinus subopacus Nomura, 1962. Tôhô-Gakuhô, 12: 48, pl. 2, fig. 16 (Is. Amami-Ôshima: Taken). - Nomura, 1963. Tôhô-Gakuhô, 13: 52 (Is. Amami-Ôshima). - Nomura, 1963. in Icon. Ins. Jap. Color. natur. ed., vol. 2 (Col.): 146 (Is. Amami-Ôshima). - M. Satô, 1965. New Entom., 13 (8) : 73 (Is. Toku-no-shima: Tokuwase-do Cave).

Male genitalia: basal piece about 1.8 times as long as the length of median lobe; apophysis of penis visible; parameres distinctly shorter than median lobe, subparallel-sided at basal two-thirds, thence strongly narrowed apically, bearing numerous setae along the inner side; median lobe strongly narrowed anteriorly, densely pubescent in ventral side.

At Is. Toku-no-shima in 1963, Mr. N. Ohbayashi and I found this species in a small pool lying deep in a limestone cave where the sunshine was entirely interrupted.

Specimens examined: 5 exs., Tokuwase-dô Cave, Is. Toku-no-shima, July 25, 1963, M. Satô and N. Ohbayashi leg.

Distribution: Is. Amami-Ôshima and Is. Toku-no-shima of the Amami Islands.

Tribe Macronychini (Mulsant & Rey, 1872) Steffan, 1961

Genus *Zaitzevia* Champion

Zaitzevia Champion, 1923. Ent. Month. Mag., (3) 9: 170.

Awadoronus Kôno, 1934. Ins. Matsum., 8 (3) : 127.

Type-species: *Zaitzevia soloidicornis* Champion, 1923.

Key to the species of the genus *Zaitzevia* in the Ryukyus

- 1 (2) Fourth, fifth and sixth intervals of each elytron catenated from the base to near apex; length 1.60-1.70 mm..... *Z. elongata* Nomura
- 2 (1) Fourth interval of each elytron catenated from the base to near apex and fifth from the base to basal half.
- 3 (4) Blackish-brown; elytra more or less distinctly punctate-striate; epipleura subparallel-sided; length 1.60-1.70 mm..... *Z. aritai* M. Satô
- 4 (3) Black; elytra less distinctly punctate-striate; epipleura narrowed posteriorly; length 1.50-1.55 mm..... *Z. yaeyamana* M. Satô

Zaitzevia elongata Nomura

Zaitzevia elongata Nomura, 1962. Tôhō-Gakuhō, 12: 49, pl. 2, fig. 17 (Is. Amami-Ôshima: Shin-mura, Ikari). - Nomura, 1963, Tôhō-Gakuhō, 13: 43, fig. 1 (Is. Amami-Ôshim). - Nomura, 1963, in Icon. Ins. Jap. Color. natur. ed., vol. 2 (Col.) : 146 (Is. Amami-Ôshima).

Male genitalia: about 2.2 times as long as the length of median lobe which is distinctly citinized; parameres membranous; a projection of each paramera crosses each other over the apical margin of paramera; copulatory piece very large and bearing numerous distinct teeth, its apical part provided with two projection.

This species was hitherto unknown from Is. Toku-no-shima and Is. Okinawa-hontô. Mrs. F. Fujii found the larva of the species in the moss, *Fissidens nagasakinus* Besck. at a riverside on Is. Oinawa-hontô. The larva will be described in the separate paper by Mrs. F. Fujii and me.

Specimens examined: 1 ex., the Kamiko-gawa River, Is. Amami-Ôshima, June 11, 1962, M. Satô leg.; 8 exs., Higashi-nakama, Is. Amami-Ôshima, March 30, 1963, Y. Arita leg.; 10 exs., Higashi-nakama, March 28, 1963, N. Ohbayashi leg.; 12 exs., Hatsuno, Is. Amami-Ôshima, July 28, 1963, M. Satô and N. Ohbayashi leg.; 12 exs., Kametsu, Is. Toku-no-shima, July 16, 1961, T. Shibata leg.; 5 exs., Kametsu, July 23, 1963, M. Satô leg.; 12 exs., Nishi-agina, Is. Tokuno-shima, July 26, 1963, M. Satô and N. Ohbayashi leg.; 26 exs., Yona, Is. Okinawa-hontô, May 25, 1963, Y. Arita leg.

Distribution: Is. Amami-Ôshima and Is. Toku-no-shima of the Amami Islands; Is. Okinawa-hontô of the Okinawa Islands.

Zaitzevia aritai M. Satô

Zaitzevia (Urumaelmis) aritai M. Satô. 1963. New Entom. 12 (7) : 40 (Is. Iriomote-jima: Shirahama, Unishiikuno mori). - M. Satô and Y. Miyatake, 1964. Rep. Comm. For. Sci. Res. Kyushu Univ., 2: 141, fig. 12 3 (Is. Iriomote-jima).

Zaitzevia aritai: Nomura, 1963. Tôhō-Gakuhō, 13: 14 (Is. Iriomote-jima).

Male genitalia: basal piece about 2.3 times as long as the length of median lobe which is distinctly citinized and stout; parameres membranous; a projec-

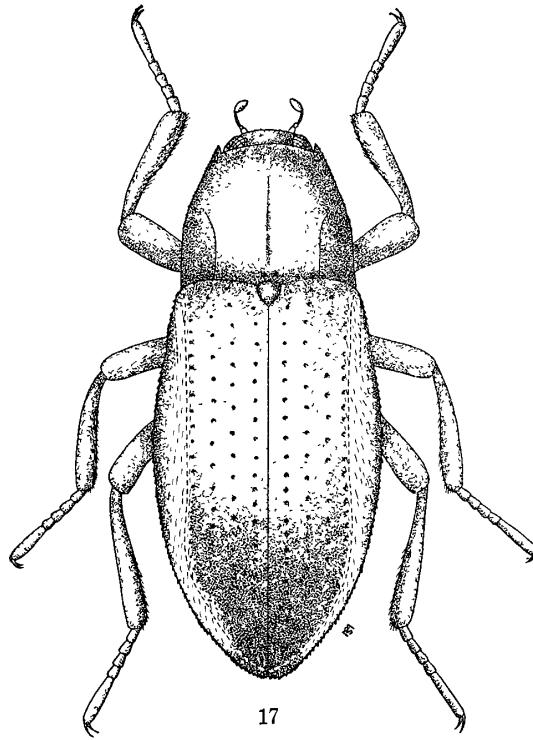


Fig. 17. *Zaitzevia aritai* M. Satô.

tion of each paramera crosses each other over the paical margin of paramera; copulatory piece situated near the middle of median lobe, divided into three parts, the apical one round and the hinder two elongate.

Distribution: Is. Iriomote-jima of the Sakishma Islands.

(To be continued)